

Notice of Allowability

Application No.

10/787,359

Applicant(s)

JI ET AL.

Examiner

Art Unit

Tuyen Q. Tra

2873

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to 6/07/2004.
2. ☒ The allowed claim(s) is/are 1-26.
3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____.

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.

THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____.
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____.

Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO/SB/08),
Paper No./Mail Date 0204
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☐ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

DETAILED ACTION

Reason For Allowance

1. Claims 1-26 are allowed.
2. Following is an examiner's statement of reasons for allowance:

The prior art taken either singularly or in combination fails to anticipate or fairly suggest the limitations of the independent claim(s), in such a manner that a rejection under 35 U.S.C. 102 or 103 would be proper. The prior art fails to teach a combination of all the claimed features as presented in independent claims 1 and 14, which include determining eye gaze parameters from the eye gaze data, wherein the eye gaze parameters include: Δx , Δy , r , θ , g_x , and g_y , wherein Δx and Δy are orthogonal projections of a pupil-glnt displacement vector directed from the center of the pupil image to the center of the glint in the image plane, wherein r is a ratio of a major semi-axis dimension to a minor semi-axis dimension of an ellipse that is fitted to the pupil image in the image plane, wherein θ is an angular orientation of the major semi-axis dimension in the image plane, and wherein g_x and g_y are mutually orthogonal coordinates of the center of the glint in the image plane.

3. Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Conclusion

4. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

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- a) Cleveland et al. (US Patent 5,231,674 A) discloses an eye tracking method in figure 4 comprising of step for illuminating (focusing) a light source (item 18) to an eye (item 16) to produce a light reflected by the eye (16); a step for using a camera to convert the light reflected by the eye into a image of at least portion of the eye formed by camera (item 12), where the image including a corneal reflection. However, Cleveland et al. does not teach or fairly suggest a step for determining eye gaze parameters from the eye gaze data, wherein the eye gaze parameters include: Δx , Δy , r , θ , g_x , and g_y , wherein Δx and Δy are orthogonal projections of a pupil-glint displacement vector directed from the center of the pupil image to the center of the glint in the image plane, wherein r is a ratio of a major semi-axis dimension to a minor semi-axis dimension of an ellipse that is fitted to the pupil image in the image plane, wherein θ is an angular orientation of the major semi-axis dimension in the image plane, and wherein g_x and g_y are mutually orthogonal coordinates of the center of the glint in the image plane.
- b) Ragland (US Patent 5,471,542 A) discloses in figure 1 a point of gaze tracker comprising of step for using camera to obtain an image of at least a portion of iridal-scleral boundary of an eye, analyzing the obtained image and for locating therein a plurality of points on the pupillary boundary; determining, from the plurality of located points on the pupillary boundary, the size and position of the pupillary ellipse in the image; and formulating, using the determined ellipse, an optical axis vector for the eye relative to the camera. However, Ragland does not teach or fairly suggest a step for determining eye gaze parameters from the eye gaze data, wherein the eye gaze parameters include: Δx , Δy , r , θ , g_x , and g_y , wherein Δx and Δy are orthogonal projections of a pupil-glint displacement vector directed from the center of the pupil image to the center of the glint in the image plane, wherein r is a ratio of a major semi-axis dimension to a minor semi-

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axis dimension of an ellipse that is fitted to the pupil image in the image plane, wherein θ is an angular orientation of the major semi-axis dimension in the image plane, and wherein g_x and g_y are mutually orthogonal coordinates of the center of the glint in the image plane.

c) Amir et al. (US PUB 2003/0098954 A1) discloses a calibration free eye gaze tracking in figure 5 comprising of step for focusing a camera (item 420) on a user's eyes, having a focal center (item 500), an image plane (item 518), and a light source (item 406) emitting light toward the eye; then identifying and locating image aspects including one glint and a pupil image in the image plane (518). However, Amir et al. does not teach or fairly suggest a step for determining eye gaze parameters from the eye gaze data, wherein the eye gaze parameters include: Δx , Δy , r , θ , g_x , and g_y , wherein Δx and Δy are orthogonal projections of a pupil-glint displacement vector directed from the center of the pupil image to the center of the glint in the image plane, wherein r is a ratio of a major semi-axis dimension to a minor semi-axis dimension of an ellipse that is fitted to the pupil image in the image plane, wherein θ is an angular orientation of the major semi-axis dimension in the image plane, and wherein g_x and g_y are mutually orthogonal coordinates of the center of the glint in the image plane.

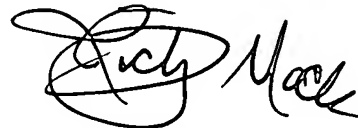
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tuyen Q. Tra whose telephone number is 571-272-2343. The examiner can normally be reached on 9:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ricky L. Mack can be reached on 571-272-2333. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

TT

August 2, 2007

A handwritten signature in black ink, appearing to read "Ricky Mack", with a stylized, cursive script.

RICKY MACK
SUPERVISORY PATENT EXAMINER